

REMARKS

Claims 1-25 are present in this application and all claims stand rejected under 35 USC 103(a) as unpatentable over US Patent Application Publication No. 2005/0194804, Feenstra et al. This rejection is traversed.

With regard to claim 1, the applicants concede that Feenstra discloses all the features of claim 1 except for the "concealment member spaced from the substrate and formed from a substantially opaque material" such that "the first fluid [can move] to a second area smaller than the first area and substantially confined between the concealment member and the substrate, so that the concealment member substantially conceals the first fluid from an observer viewing the display from the opposed side of the concealment member from the substrate". The Office Action concedes that Feenstra does not describe a concealment member, and does not show such a concealment member in any prior art form of electro-optic display. However, the Office Action states, the prior art teaches in Figure 5 that the first fluid (oil) is inside a cover and thus it would have been obvious to a person of ordinary skill in the art to modify in Figure 5, the first fluid (oil) that is inside a cover to obtain a concealment member because this would prevent intermixing of both sub-layers adjoining the wall the device preferably comprises means to prevent part of the other fluid layer and the further other fluid layer to intermix in the second state, as taught in Paragraph [0019] of Feenstra.

It is not entirely clear to applicant what "cover" the Office Action is referring to in Feenstra's Figure 5, since the description of Figure 5 at Paragraphs [0045] to [0049] does not use this term. If, however, the Office Action intends the term "cover" to refer to the "pixel walls 13" (see for example Paragraph [0041]) at the upper end of the device as illustrated, it is respectfully noted that this cover has essentially nothing in common with the concealment member of present claim 1. The cover 13 must be light-transmissive, since for an observer to view the device of Figure 5 in the direction of the arrows 16, the light must pass through the cover 13, be reflected within the device and

pass back through the cover 13. Hence, the cover 13 can in no way function as a concealment member.

Furthermore, Feenstra already contains observations which show the desirability of a concealment member. Paragraph [0033] states that at practical driving voltages, the droplets following breakup occupy about 25% of the area of the cell, and that it is desirable to reduce this fraction but to do would involve the use of higher voltages, with consequent increase in power dissipation and preclusion of the use of low voltage drivers. The use of a concealment member in accordance with present claim 1 in effect reduces the fraction of the area of the cell occupied by the droplets after breakup, thus improving the contrast ratio of the display. The fact that Feenstra appreciated the problem of the droplets occupying a substantial fraction of the area of the cell following breakup, but was unable to conceive of a way of overcoming this problem without the use of higher driving voltages, shows that the use of a concealment member in accordance with present claim 1 was not obvious to a skilled worker in the art.

Paragraph [0019], even it is applies to the embodiment of Figure 5 (which is far from clear) in no way renders present claim 1 obvious. This Paragraph must refer to the vertical (as illustrated) walls 13 which separate the two oil phases 5R and 5G in Figure 5 of Feenstra. These walls are not concealment members and do not conceal any portion of the two oil phases. Hence, this Paragraph does not render present claim 1 obvious.

Claims 2-4 are patentable over Feenstra for the same reasons as claim 1.

Present claim 5 is directed to a display comprising a substrate having first and second portions differing in optical characteristics, with first and second electrodes disposed adjacent the first and second portions of the substrate. The display further comprises immiscible first and second fluids such that by controlling the potentials applied to the first and second electrodes, the first fluid can be made to assume a first position, wherein the first fluid substantially covers the second portion of the substrate, leaving the first portion uncovered, and a second position, wherein the first fluid

substantially covers the first portion of the substrate, leaving the second portion uncovered. A version of such a display with a substrate having four differently colored portions is illustrated in Figure 3 of the present drawings.

Feenstra does not disclose any substrate having visually different first and second portions equipped with separate electrodes. With respect, the rejection of claim 5 on pages 3-5 of the Office Action discusses at considerable length the various colors present in the multiple fluids present in Figures 5-7 of Feenstra, but makes no attempt to show that any substrate present in Feenstra contains visually different portions, or why such a substrate should be obvious over the use of multi-colored liquids. As discussed in Paragraph 68 of this application, the display of present claim 5 enables multiple colors to be produced using a single colored fluid which in effect acts as an optical shutter to expose or conceal various colored portions of a substrate. Feenstra does not disclose the use of a single fluid in this manner, or anything resembling such a display, and for this reason claim 5 cannot be obvious over Feenstra.

Claims 6-14 are patentable over Feenstra for the same reasons as claim 5.

Present claim 15 is directed to a display comprising a first substrate through which an observer can view the display, a second substrate spaced from the first substrate and at least one sidewall extending between the first and second substrates, the first and second substrates and the sidewall together defining a chamber having a first substrate surface, a second substrate surface and at least one sidewall surface; a first fluid disposed within the chamber, the first fluid absorbing at least one wavelength of light; a light-transmissive second fluid immiscible with the first fluid and disposed within the chamber; a first electrode disposed adjacent the second substrate surface of the chamber; a second electrode disposed adjacent a sidewall surface of the chamber; and a third electrode extending into the chamber and in electrical contact with the second fluid, such that, by controlling the potentials applied to the first, second and third electrodes, the first fluid can be made to assume a first position, wherein the first fluid lies adjacent the second substrate surface of the chamber, *and a second position, wherein the first fluid lies*

adjacent a sidewall surface of the chamber (emphasis added). Such a display is illustrated in Figure 5 of the present drawings.

Feenstra does not describe a display satisfying the italicized portion of claim 15 as set out above. The Office Action draws attention to Figure 4 of Feenstra. However, Paragraphs [0040] to [0042] of Feenstra state that the device of Figure 4 has two separate oil layers 5, 5' on either side of the fluid (water) 6 (see Paragraph [0040]) such that the two oil layers 5, 5' can be switched independently (see Paragraph [0042]). The only logical interpretation of this description is that each of the oil layers 5 and 5' functions in exactly the same manner as the oil layer 5 in Feenstra's Figures 1a and 1b, switching between a continuous film, as illustrated in Figure 1a, and a series of spaced droplets, as illustrated in Figure 1b. There is nothing to suggest that either oil layer 5 or 5' in Figure 5 can lie adjacent the sidewalls in Feenstra's Figure 4, and indeed to illustrated electrode arrangement would appear to preclude this.

Claims 16-18 are patentable over Feenstra for the same reasons as claim 15.

Present claim 19 is directed to a display comprising: a fluid; a substrate having an exposed surface resistant to wetting by the fluid; at least three conductive vias extending through the substrate and terminating adjacent the exposed surface thereof; and cap members covering the ends of the conductive vias adjacent the exposed surface, the cap members being formed of a material wetted by the fluid. This form of the invention is illustrated in Figure 7 of the drawings. The combination of vias and caps enables a working fluid to be moved across the substrate, as illustrated in Figure 7 and described in Paragraphs 83 and 84 of the specification.

Feenstra does not disclose any surface having conductive vias passing therethrough, nor an exposed surface which is resistant to wetting by a fluid but having cap members formed of a material wetted by the fluid. In all cases in Feenstra the surfaces in contact with the fluids (for example, the layer 8 in Feenstra's Figure 1a) are essentially homogeneous and are not divided into wetted and non-wetted regions. With

respect, the comments in the paragraph bridging pages 7 and 8 of the Office Action regarding the cover in Feenstra's Figure 5 are irrelevant; as discussed above, the cover in question is simply a cover which seals the display and in no way affects its operation. Furthermore, there is no suggestion in Feenstra that such a cover have areas which are wetted or non-wetted by the fluid, as required by present claim 19.

Claims 20 and 21 are patentable over Feenstra for the same reasons as claim 19.

Present claim 22 is directed to an electrowetting display, generally similar to that described in Feenstra, in which the first fluid is colored with pigment particles or nanoparticles. Feenstra does not describe the use of either pigment particles or nanoparticles, and the discussion of claim 22 on pages 8 and 9 of the Office Action fails to suggest any reason why the skilled person would use pigment particles or nanoparticles in the Feenstra display. Accordingly, claim 22 is patentable over Feenstra.

Finally, claim 23 is directed to the type of *bistable* electrowetting display shown in Figure 4 of the present drawings. Claim 23 requires that the display comprise two non-light-transmissive fluids having differing colors, the display having a first stable state wherein the first fluid lies adjacent a first electrode so that the color of the second fluid is visible to an observer viewing the display through a second electrode, and a second stable state wherein the first fluid lies adjacent the second electrode so that the color of the first fluid is visible to the observer. Applicants readily acknowledge that Feenstra describes, in Figures 4-7, various devices which use two or three differently colored fluids. However, it is readily apparent, from the discussion at Paragraphs [0042] to [0055] of Feenstra, that in all cases the various colored fluids act independently of one another, with each colored fluid operating in a manner exactly parallel to the fluid 5 in Feenstra's Figures 1a and 1b, with the fluid shifting between a continuous film as shown in Figure 1a and a series of discrete droplets as shown in Figure 1b. There is no suggestion in Feenstra that the positions of two colored fluids be "flipped" as required by present claim 23, so that the two colored fluids interchange positions adjacent two spaced

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electrodes; in Feenstra's Figure 5, for example, the fluids 5R and 5G always remain adjacent the electrodes 17 and 18 respectively, while the fluid 5B always remains adjacent the electrode 11.

With respect, the comments on page 10 of the Office Action regarding the stability of the oil film 5 are irrelevant to the patentability of claim 23. The applicants do not dispute that the oil film 5 may be highly stable in the position shown in Feenstra's Figure 1a, but in all the Feenstra devices, the oil film is only *monostable*; as is readily apparent from Feenstra's Paragraph [0033], the oil film state shown in Figure 1b is only stable so long as a driving voltage is applied; once this driving voltage is removed, the oil film reverts to the state shown in Figure 1a. There is nothing in Feenstra to suggest that it is possible to produce a *bistable* oil film as required by claim 23.

Claims 24 and 25 are patentable over Feenstra for the same reasons as claim 23.

For the foregoing reasons, the 35 USC 103 rejections in the Office Action are unjustified and should be withdrawn.

Reconsideration and allowance of all claims of this application is respectfully requested.

Since the prescribed period for responding to the Office Action expired February 13, 2008, there is also filed herewith a Petition for a one month extension of this period.

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